

Claims

1. A powder coating apparatus, comprising:
- a crude gas chamber,
- a clean gas chamber,
- an air flow path between said clean gas chamber and said
- 5 crude gas chamber,
- a first filter element positioned in said air flow path,
- a first gas discharge device configured to direct a first gas
- stream with powder particles therein in said air flow path from said crude
- gas chamber through said first filter element into said clean gas chamber,
- 10 a first shut-off device configured to interrupt the first gas
- stream through said first filter element,
- a second gas discharge device configured to direct a second
- gas stream through said first filter element into said crude gas chamber, and
- a first filter element moving device coupled to said first filter
- 15 element and configured to move said first filter element in a manner which
- dislodges the powder particles therefrom.

2. The powder coating apparatus of claim 1, wherein said second gas discharge device further comprises:

a movable nozzle element mounted for movement relative to said first filter element, and

5 a drive mechanism coupled with said movable nozzle element and configured to move said nozzle element as the second gas stream is directed at said first filter element.

3. The powder coating apparatus of claim 1, further comprising:

a second filter element arranged in parallel with said first filter element,

a second shut-off device configured to interrupt the first gas stream through said second filter element, and

5 a second filter element moving device coupled to said second filter element and configured to move said second filter element in a manner which dislodges the powder particles therefrom.

4. The powder coating apparatus of claim 1, wherein said first filter element moving device further comprises a pneumatic cylinder capable of being intermittently charged with pressurized gas, and including a piston rod capable of reciprocating movement within said cylinder as a result of

5 said cylinder being intermittently charged with the pressurized gas, and said reciprocating movement causing movement of said first filter element.

5. The powder coating apparatus of claim 1, wherein said second gas discharge device further comprises:

a rotatable nozzle element mounted for rotation relative to said first filter element, and

5 a drive mechanism coupled with said rotatable nozzle element and configured to rotate said nozzle element as the second gas stream is directed at said first filter element.

6. The powder coating apparatus of claim 5, wherein said rotatable nozzle element further comprises:

an elongated arm with a gas channel therein and a plurality of gas outlet channels directed at said first filter element.

7. The powder coating apparatus of claim 6, wherein said gas outlet channels are arranged such that said movable arm can be rotated by the gas flowing out of said gas outlet channels.

8. The powder coating apparatus of claim 7, wherein said gas outlet channels have respective spaced apart longitudinal axes and said movable arm rotates about a rotational axis, said longitudinal axes positioned on said arm and slanted with respect to said rotational axis at

5 angles of 15°-30°.

9. The powder coating apparatus of claim 8, wherein said angles are each about 22°.

10. A method for cleaning a first filter element of powder particles filtered from a gas within a powder coating apparatus having a crude gas chamber and a clean gas chamber and the first filter element having first and second surface area portions positioned in an air flow path between the crude gas chamber and the clean gas chamber, the method comprising:
- 5 directing the gas mixed with the powder from the crude gas chamber through the first filter element into the clean gas chamber,
- directing a cleaning gas stream through the first filter element in the direction of the clean gas chamber, and
- 10 moving the cleaning gas stream between the first and second surface area portions to dislodge the powder from the first filter element.

11. The method of claim 10, wherein moving the cleaning gas stream further comprises:

moving the cleaning gas stream in a rotational manner.

12. A method for cleaning a filter element of powder filtered from a gas within a powder coating apparatus having a crude gas chamber and a clean gas chamber and the first filter element positioned in an air flow path between the crude gas chamber and the clean gas chamber, comprising:
- 5 directing the gas mixed with the powder from the crude gas chamber through the first filter element into the clean gas chamber,
- directing a cleaning gas stream through the first filter element in the direction of the clean gas chamber, and
- moving the first filter element to dislodge the powder from the
- 10 first filter element.

13. The method of claim 12, wherein moving the first filter element further comprises:

vibrating the first filter element.

14. A method for cleaning a filter element of powder filtered from
a gas within a powder coating apparatus having a crude gas chamber and a
clean gas chamber and first and second filter elements positioned in parallel
in an air flow path between the crude gas chamber and the clean gas
5 chamber, comprising:
 directing the gas mixed with the powder from the crude gas
chamber through the first and second filter elements into the clean gas
chamber,
 interrupting the flow of the gas mixed with the powder
10 through the first filter element while maintaining the flow of the gas mixed
with the powder through the second filter element,
 directing a cleaning gas stream through the first filter element
in the direction of the clean gas chamber, and
 moving the first filter element to dislodge the powder from the
15 first filter element.